Australian Journal of Taxonomy
Open-access, online, rapid taxonomy
https://doi.org/10.54102/ajt

A diminutive, long-legged stiletto fly from Western Australia (Diptera: Therevidae: Agapophytinae)

Shaun L. Winterton

California State Collection of Arthropods, California Department of Food & Agriculture, Sacramento, California, USA
Corresponding author: wintertonshaun@gmail.com
Shaun Winterton https://orcid.org/0000-0001-8995-0907.

© Copyright of this paper is retained by its authors, who, unless otherwise indicated, license its content under a CC BY 4.0 license

Abstract

A new genus and species of Therevidae is described from Western Australia. Individuals of *Hort yealensis* gen. *et* sp. n. are relatively small but with greatly elongate legs, which is an unusual morphological trait for stiletto flies.

Cite this paper as: Winterton SL (2023). A diminutive, long-legged stiletto fly from Western Australia (Diptera: Therevidae: Agapophytinae). *Australian Journal of Taxonomy* 14: 1–9. doi: https://doi.org/10.54102/ajt.319oa

urn:lsid:zoobank.org:pub:6697D4FC-CC84-4224-BD60-8F4EACAFEBD9

Introduction

Stiletto flies (Therevidae) are found in all major biogeographical regions of world, but are particularly species-rich in Australia where the arid, friable soils provide an excellent habitat for the fossorial larvae. Australia contains over 350 described species of Therevidae in at least 30 genera, although all representing the subfamilies Agapophytinae and Therevinae (Irwin & Winterton, 2016); the families Phycusinae and Xestomyzinae are absent from Australia.

Western Australia is notable for a high number of endemic species of stiletto flies, with 59 of the 83 described species present in the region being endemic, particularly the south-eastern corner of the state. These numbers will undoubtedly grow as more species are described, but it is clear that the south west of Western Australia represents a centre of endemism for stiletto flies. Several genera of Australian Therevidae that are particularly species rich in this region include *Neodialineura* Mann, 1928, *Manestella* Metz, 2003, *Medomega* Winterton & Lambkin, 2012, *Sidarena* Irwin & Winterton, 2016 and *Acupalpa* Kröber, 1912 (Winterton, 2009, 2011; Winterton & Lambkin 2012; Irwin & Winterton 2016).

Methods

Terminology follows Cumming & Wood (2017) with additional therevid-specific genitalic morphology according to Winterton *et al*. (1999a,b). Genitalia were macerated in lactic acid or potassium hydroxide to remove soft tissue, then rinsed in distilled water (neutralised with acetic acid as needed) and dissected in 80% ethanol. Genitalia preparations were placed in glycerine in a genitalia vial and mounted on the pin beneath each specimen. Specimen images were taken at different focal points using a digital camera and subsequently combined into a serial montage image using Helicon Focus (HeliconSoft Ltd. Kharkiv, Ukraine). Geospatial coordinates, either included on the original collection label or approximated a posteriori, are listed in brackets. Collection depositories from which specimens were examined: Western Australian Museum, Perth, Australia

This paper was submitted on 29 November 2022 and published on 9 March 2023 (2023-03-09T09:17:19.276Z). It was reviewerd by David Ferguson and Christine Lambkin, and edited by Mark Harvey. Australian Journal of Taxonomy. ISSN: 2653-4649 (Online).

Figure 1. *Hort yealensis* gen. *et* sp. n., live adult, Yeal Nature Reserve, Western Australia (photo copyright: Fred and Jean Hort).

(WAM); California State Collection of Arthropods, Sacramento, USA (CSCA).

Taxonomy

Hort Winterton, gen. n.

Figs 1–3, 6–10

urn:lsid:zoobank.org:act:EF957C47-AF9E-450D-B4D9-57779ED1202F

Type species. *Hort yealensis* Winterton, sp. n.

Diagnosis. Relatively small individuals with greatly elongate legs; eyes widely separated in both sexes; frons, vertex and occiput concave with scattered, elongate macrosetae; wing cell m3 open; femora lacking macrosetae; antennae shorter than head, flagellum turbinate.

Description. *Head* (Fig. 3). Macrosetae numerous, elongate and curved, frons wide in both sexes, eyes separated by width greater than ocellar tubercle, inner margin of eyes subparallel, frons sunken, raised around base of antennae, grey pubescent; head length and height subequal; parafacial without setae; face flat; gena rounded; occiput pubescence dull silver to greyish brown, postocular ridge and occiput of male and female with macrosetae few in number, irregularly arranged, elongate anteriorly; antennal length shorter than head, antennae positioned on lower half of head and strongly directed anteroventrally; flagellum shape turbinate, abruptly conical tapered, length subequal to combined length of scape and pedicel, style apical, minute; scape short, thickened, wider than other segments; palpus slender, mouthparts short. *Thorax*. Central depression of prosternum without setae; pleuron overlain with dense silver or grey pubescence; metanepisternum with postspiracular setae absent; scutum covered with filiform setae, often of variable length; posterior surfaces of coxae without setae, hind coxal knob present; legs relatively elongate and equal length; femora with velutum patches and macrosetae absent; tibial macrosetae regular sized; wing cell m3 open, veins M3 and M4 separate to margin; wing vein R2+3 shape straight to wing margin; wing colouration and markings smoky due to wing membrane being densely covered with microtrichia. *Abdomen*. Relatively short and slender (especially in male), slightly narrowed along length; tergite 2 setae uniform and regular in length. *Male terminalia*. Gonocoxites separate medially, margins proximal; hypandrium present, subtriangular; gonocoxites with velutum patch present ventromedially; inner gonocoxal process present, articulated; outer gonocoxal process

Figure 2. *Hort yealensis* gen. *et* sp. n., live adult, Yeal Nature Reserve, Western Australia (photo copyright: Fred and Jean Hort).

Figure 3. *Hort yealensis* gen. *et* sp. n., heads, oblique view. A. female; B. male.

elongate; ventral lobe rounded apically; phallus with dorsal apodeme of parameral sheath 'T'-shaped, strongly fused laterally with gonocoxites; distiphallus short, straight, ventral apodeme forked. *Female terminalia*. Acanthophorite macrosetae with two sets present (A1 & A2), A1 enlarged, A2 reduced in size; tergite 8 with broad anteromedial process; sternite 8 posterior margin emarginate posteromedially; spermathecal sac small and rounded; three spermathecae joining to common spermathecal sac duct.

Etymology. I am pleased to name this genus after Fred and Jean Hort, who not only discovered this new species, but also provided the photographs of live adults in their natural habitat (Figs 1, 2, 4, 5).

Comments. Amongst Agapophytinae genera, *Hort* gen. n. is distinguished by the frons being wide in both the male and female, cell m3 open and femora lacking both velutum patches and macrosetae. *Hort* gen. n. can be identified using the key to Australasian genera in Winterton (2011), after Winterton & Lambkin (2012), where

Figure 4. Low sclerophyll sandy heath, Yeal Nature Reserve, Western Australia; habitat of *Hort yealensis* gen. *et* sp. n.

it would key out to *Manestella* in couplet 19. *Hort* gen. n. is likely closely related to *Manestella*, and can be separated from it by the scattered irregular macrosetae on the postocular ridge and occiput (single row in male of *Manestella*) and the elongate legs (short in *Manestella*).

Included species. *Hort yealensis* Winterton, sp. n.

Hort yealensis Winterton, sp. n.

Figs 1–3, 6–10

urn:lsid:zoobank.org:act:2573D612-AC04-4423-8E85-B8B4E2CD859B

Diagnosis. As per genus.

Description. Body length: 5.0–5.5 mm (male), 5.5–7.5 mm (female). *Head*. Grey pubescent, macrosetae numerous, elongate and curved (longer and more numerous in male), frons slightly wider in male, frons sunken, raised around base of antennae, more so in male; occiput pubescence silver to greyish brown, postocular ridge with black macrosetae, longer in male; antennal length shorter than head, flagellum turbinate, abruptly tapered, length subequal to combined length of scape and pedicel; scape wider than other segments with numerous black macrosetae; palpus slender, mouthparts short. *Thorax*. Pleuron and scutum overlain with dense silver-grey pubescence; scutum with sparse filiform setae, denser anteriorly; scutal chaetotaxy (pairs of macrosetae): notopleural, 2; supra alar, 1; post alar, 1; dorsocentral, 6–10; scutellar 1; coxae with grey pubescence, posterior surfaces of coxae without setae, anterior surfaces with numerous elongate black macrosetae; legs greatly elongate and largely equal length; femora black, tibiae and tarsi dark yellow, black distally; wing dark mottled, markings smoky due to wing membrane being densely covered with microtrichia; venation dark, membane dark around veins. *Abdomen*. Dark grey pubescent, tergites brown laterally, light grey posterolaterally on tergites 1–7; vestiture sparse, short dark setae. *Male terminalia*. Gonocoxites and epandrium dark brown with strong black macrosetae; hypandrium narrow sub-triangular; gonocoxites with velutum patch present well developed; inner gonocoxal process present narrow and rounded apically, setae absent apically; outer gonocoxal process rounded; ventral lobe rounded apically and relatively short; phallus with dorsal apodeme of parameral sheath 'T'-shaped, strongly fused laterally with gonocoxites laterally; distiphallus short, and slightly recurved dorsally, ventral apodeme relatively short. *Female terminalia*. Spermathecal sac small and rounded; three spermathecae joining to com-

Figure 5. Jean Hort, at the type locality in Yeal Nature Reserve, photographing and collecting specimens of *Hort yealensis* gen. *et* sp. n.

mon spermathecal sac duct with relatively elongate spermathecal ducts.

Type material. **Holotype** male, AUSTRALIA: **Western Australia**: Yeal (-31.4298, 115.8562), 3.VII.2019, J. & F. Hort, low open sand heath (WAM E114123 (#8905); WAM). **Paratypes**. AUSTRALIA: **Western Australia**: 1 male, 3 females, same data as holotype, 3.VII.2019, 8.VII.2019 (WAM E114124 (#8901), WAM E114125 (#8904), WAM E114126 (#8953), WAM E114127 (#8899); WAM); 1 female, Chittering (-31.4741, 115.9766), 7.VII.2019, J. & F. Hort, diverse flora (WAM E114128 (#8945); WAM).

Other material examined. AUSTRALIA: **Western Australia**: 1 male, 2 females, Yeal (-31.4298, 115.8562), 3.VII.2019, 7.VII.2019, 8.VII.2019, J. & F. Hort, low open sand heath (#8902, #8909, #8954; CSCA).

Etymology. The species epithet is named after the type locality, Yeal Nature Reserve (Fig. 5) .

Comments. *Hort yealensis* gen. *et* sp. n. is a highly distinctive species compared with all other Therevidae. The elongate legs and relatively small body size is not found in any other stiletto fly and is reminiscent of the body form found in some Apsilocephalidae and Evocoidae. Adults of *Hort yealensis* gen. *et* sp. n. are found sitting on sand in open sandy heath habitat (Figs 1, 2, 4). Unusual for stiletto flies, they are apparently active during the winter, with average July temperatures ranging from 10–18°C. and rainfall recorded on an average 14 days out of the month.

Disclosures

No financial disclosures or conflicts of interest are declared.

Acknowledgments

Acknowledgements. Thank you to Fred and Jean Hort for bringing this species to my attention through their nature photography. Thank you also to the Editor and Christine Lambkin for their comments on the draft manuscript.

References

Cumming, J.M. & Wood, D.M. (2017) Adult morphology and terminology. p. 89–133, In: Kirk-Spriggs, A.H. & Sinclair, B.J. (eds), *Manual of Afrotropical Diptera*. Pretoria, South African National Biodiversity Institute. v. 1.

Irwin, M.E. & Winterton, S.L. (2016) New genera of Australian stiletto flies (Diptera, Therevidae). *ZooKeys*, 618, 97–128.

Winterton, S.L. (2009) Revision of the stiletto fly genus *Neodialineura* Mann (Diptera: Therevidae): an empirical example of cybertaxonomy. *Zootaxa*, 2157, 1–33.

Winterton, S.L. (2011) Revision of the stiletto fly genera *Acupalpa* Kröber and *Pipinnipons* Winterton (Diptera,

Figure 6. *Hort yealensis* gen. *et* sp. n., male, lateral view.

Figure 7. *Hort yealensis* gen. *et* sp. n., male, oblique view.

Figure 8. *Hort yealensis* gen. *et* sp. n., female, lateral view.

Figure 9. *Hort yealensis* gen. *et* sp. n., female, dorsal view.

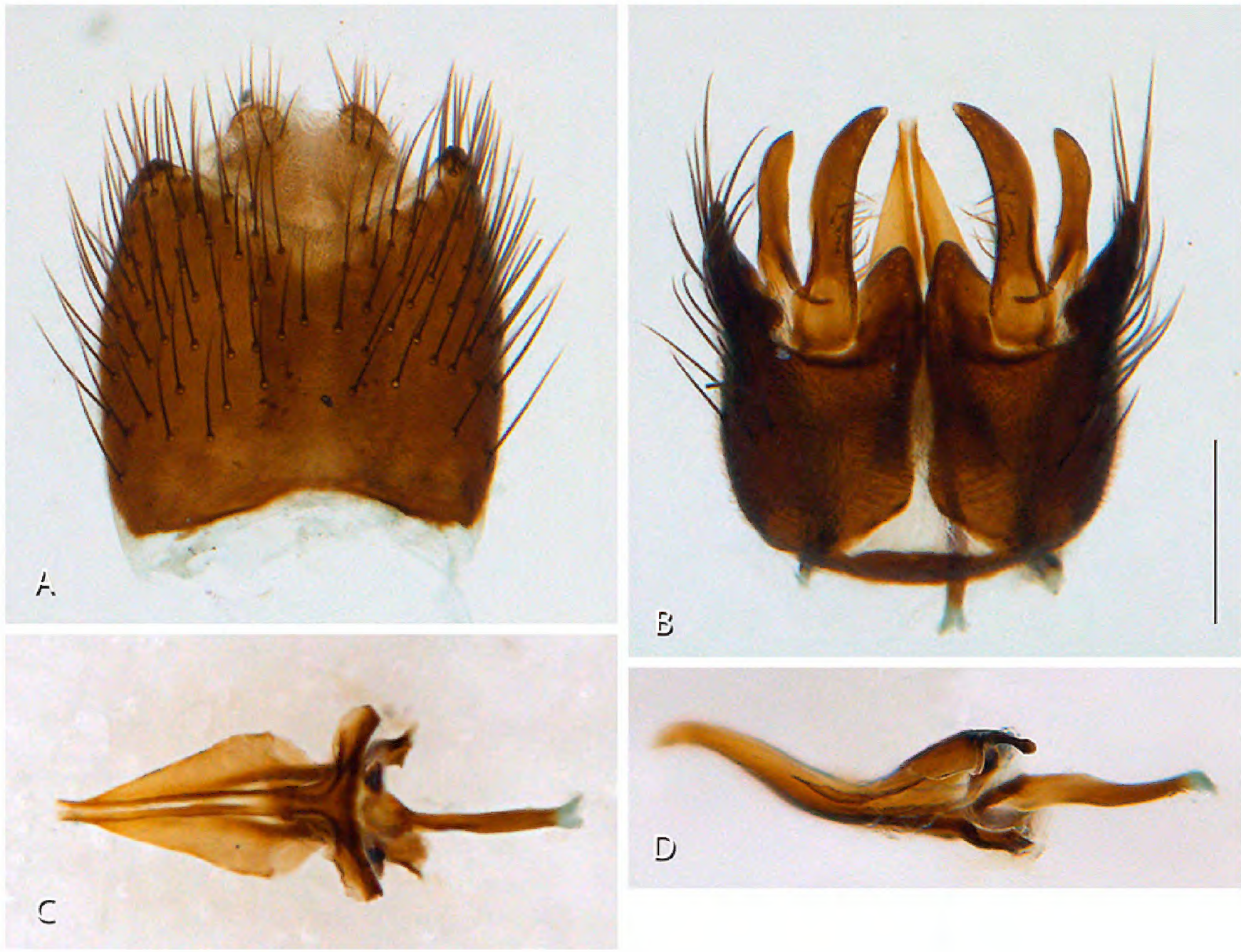

Figure 10. *Hort yealensis* gen. *et* sp. n., male genitalia. A. epandrium; B. gonocoxites with phallus, ventral view; C. phallus, dorsal view; D. phallus, lateral view. Scale line: 0.2 mm.

Therevidae, Agapophytinae) using cybertaxonomic methods, with a key to Australasian genera. *Zookeys*, 95, 29–78.

Winterton, S.L., Irwin, M.E. & Yeates D.K. (1999a) Systematics of *Nanexila* Winterton & Irwin, gen. nov. (Diptera: Therevidae) from Australia. *Invertebrate Taxonomy*, 13, 237–308.

Winterton, S.L., Irwin, M.E. & Yeates D.K. (1999b) Phylogenetic revision of the *Taenogera* Kröber genus-group (Diptera: Therevidae), with descriptions of two new genera. *Australian Journal of Entomology,* 38, 274–290.

Winterton, S.L. & Lambkin, C.L. (2012) New Australian stiletto flies: revision of *Manestella* Metz and description of *Medomega* gen. n. (Diptera, Therevidae, Agapophytinae). *ZooKeys*, 240, 1–119.

This paper was typeset using Prince

www.princexml.com